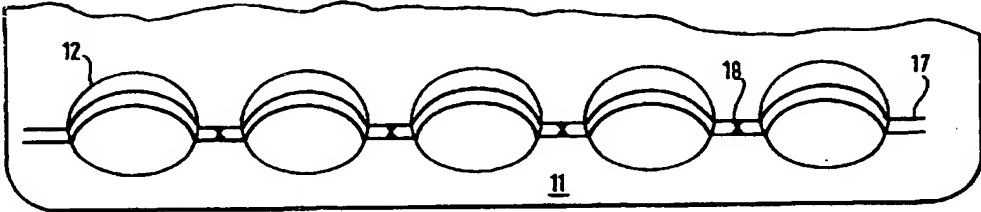


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<b>(21) International Application Number:</b> PCT/GB97/01108 <b>(22) International Filing Date:</b> 22 April 1997 (22.04.97) <b>(30) Priority Data:</b> 9608268.0 22 April 1996 (22.04.96) GB <b>(71)(72) Applicant and Inventor:</b> ROBERTSON, James, Lake [GB/GB]; 4 Church Walk, Vicarage Road, Bagillt, Flintshire CH6 6EE (GB). <b>(74) Agent:</b> CHETTLE, Adrian, John; Withers & Rogers, 4 Dyer's Buildings, Holborn, London EC1N 2JT (GB).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
<b>(54) Title:</b> BLISTER PACK WITH SECURITY STRIP    <b>(57) Abstract</b> <p>A blister pack includes an unburstable security strip (17) which ensures that individual blisters are opened in a predetermined sequence. Printed indicia are included to indicate the manner in which the first blister of the sequence can be opened. The pack is suitable for pharmaceutical tablets and provides resistance to unauthorized opening by children.</p>		

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### BLISTER PACK WITH SECURITY STRIP

This invention relates to a blister pack and particularly to a blister pack for solid medicaments and the like.

5 Blister packs are frequently used for pharmaceutical tablets. They usually comprise a relatively rigid plastics sheet having recesses (or blisters) therein and a cover sheet of frangible foil/plastics laminate. Tablets are placed one in each blister during manufacture and the  
10 laminate is heat sealed to the blister sheet to close the blisters in a hermetic and sterile manner. Tablets are dispensed by depressing the blister, thus causing the tablet to burst through the foil laminate.

The blister sheet is usually of clear plastic and thus  
15 a blister pack is tamper evident. For this reason, and partly due to legislation, the dispensing of tablets in blister packs is increasing. Furthermore the laminate may be printed with information concerning the order and day on which tablets are to be taken; this is especially useful in  
20 the case of oral contraceptives.

Blister packs are not child resistant because the force necessary to break the foil laminate is low. It is undesirable to increase laminate strength since this may give difficulty to the elderly. One solution is to supply  
25 blister packs in a separate container with a child resistant cap (CRC) but this increases cost whilst relying on the vigilance of the patient. What is required is an

inexpensive method of rendering blister packs inherently child resistant.

According to the present invention there is provided a blister pack comprising a blister sheet and a cover sheet  
5 fixed thereto to define a plurality of individual blisters, an unburstable security strip extending over a plurality of individual blisters and being adapted to permit individual blisters to be opened in predetermined sequence.

10 In a preferred embodiment the strip lies against the cover sheet and extends over the individual blisters to prevent the contents of the blisters being burst through the cover sheet, means being provided to release the strip according to instructions printed on the pack.

15 In this way a child who cannot read is unable to determine the manner in which the security strip is released. In a preferred embodiment the strip extends both above and below the chambers defined by the individual blisters and may comprise upper and lower thread portions joined by a slip knot between each blister of a sequence,  
20 the ends of the thread portions being secured in a manner which permits one blister to be opened. This arrangement has the advantage that printed instructions can identify the only blister which is capable of being opened, correct opening of the first blister and consequent slacking of the  
25 thread portions permitting the second blister of the sequence to be opened, and so on.

In an alternative embodiment the security strip

comprises a single strip overlying each blister chamber and attached or sealed to the blister sheet, for example by heat, on each side of each chamber in a manner which permits opening of blisters in sequence. For example the strip may be secured by directional release means in such a way as to ensure weakening of the next sequential attachment as the contents of the preceding blister is ejected. A peelable seal may be suitable. This arrangement again relies on identification of the first blister by for example printing on the blister pack.

The blisters may be arranged to open in a straight line sequence or in a random sequence.

The present invention also ensures that patients take blister packed medicaments in a predetermined sequence rather than randomly from the blister pack. This is especially useful in the case of tablets having different dose requirements over time, or placebo doses. For example oral contraceptives often comprise a 21 day sequence followed by 7 dose free days. Some patients prefer a 28 day pack containing 7 placebos but in this case it is absolutely essential that the tablets are taken in the correct sequence. The same applies in the case of different medicaments which must be taken in a predetermined sequence to have a desired effect. The present invention ensures that the correct sequence can be followed, which is not the case where medicaments are supplied in separate containers.

An embodiment of the invention will now be described

with reference to a preferred embodiment shown by way of example only in the accompanying drawings in which:

Fig. 1 illustrates a portion of a blister pack from above;

5 Fig. 2 illustrates a portion of a blister pack from below; and

Fig. 3 is a somewhat schematic side elevation of a blister pack.

10 With reference to the drawings, a blister pack comprises the usual clear plastics blister sheet 11 having a plurality of individual part spherical blisters 12. A cover sheet 13 comprising a foil/plastics laminate is heat sealed to the blister sheet around each blister 12 to define individual hermetically sealed chambers 14 each containing  
15 a tablet 15 (one illustrated).

The foregoing describes a conventional blister pack from which tablets are individually extracted by depressing a blister in the direction of arrow 16 and bursting the tablet through the cover sheet 13 immediately over the  
20 blister.

The blister pack according to the invention includes a double thread 17 extending above and below each tablet of each blister and joined between adjacent blisters by a

series of slip knots 18. Individual tablets are surrounded by the double thread 17 during the manufacturing process, and the thread is sufficiently strong to ensure that it cannot be burst by the application of normal pressure on the blisters; the tablets are thus secured against release in the normal manner. The threads are hidden from view by the cover sheet, and if observed through the blister sheet they look alike.

One tablet in the sequence is however arranged with loose threads, for example that associated with end chamber 14A, and identified by writing or printing on the blister pack itself. Accordingly the patient can remove the first tablet of a sequence, and once removed the slack thread 17 permits the next tablet of the sequence to be ejected, and so on. In practice the double thread slides through the slip knot from the opened blister as the next tablet is ejected and this permits the next tablet to be released whilst leaving the remaining tablets of the sequence undisturbed and secure.

The type of thread or security strip, the materials and the manner in which it is secured between the blister sheet and the cover sheet can be selected according to the size of blister, required ejection force and the like.

Although the invention has been described in relation to pharmaceutical tablets, it is also applicable to blister packing in which a particular sequence of opening is desirable, for example in model making or in the use of

reactive chemicals.

The present invention also discloses an unburstable security strip between the blister sheet and the cover sheet. In the alternative however such a security strip could lie on the outside of the cover sheet and be adapted to permit opening of blisters in a predetermined sequence, for example by directionally sensitive heat sealing as previously described.

In this specification the term 'strip' includes any flexible longitudinal member adapted to prevent bursting of a blister, and includes strings, cords, threads and the like.



CLAIMS:

1. A blister pack comprising a blister sheet and a cover sheet fixed thereto to define a plurality of individual blisters, an unburstable security strip extending  
5 over a plurality of individual blisters and being adapted to permit individual blisters to be opened in a predetermined sequence.

2. A blister pack according to claim 1 wherein said strip lies against said cover sheet.

10 3. A blister pack according to claim 1 or claim 2 wherein said strip lies between said blister sheet and said cover sheet.

4. A blister pack according to any preceding claim wherein said strip is attached to said blister pack.

15 5. A blister pack according to claim 4 wherein said strip is heat sealed to said blister pack.

6. A blister pack according to any preceding claim wherein said strip extends both above and below chambers defined by individual blisters of said blister sheet.

20 7. A blister pack according to any preceding claims wherein said strip is secured by directional release means.

8. A blister pack according to claim 7 wherein said strip comprises an upper thread portion and a lower thread portion, the thread portions being joined between each  
25 blister of a sequence.

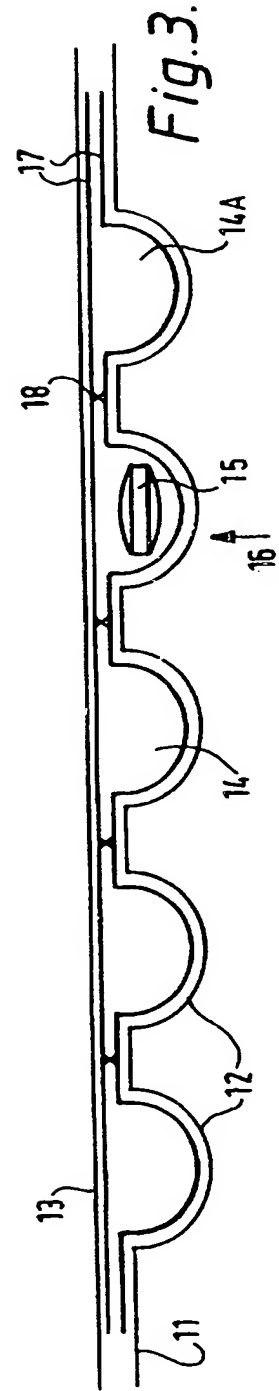
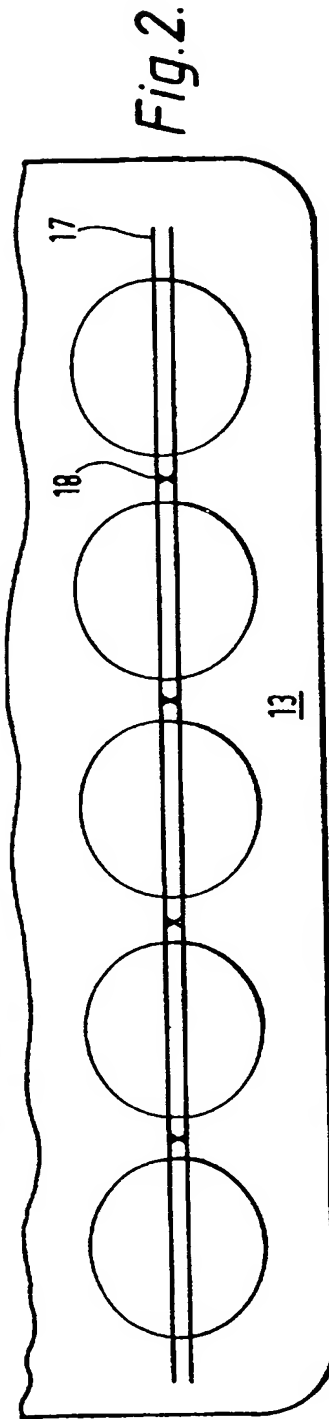
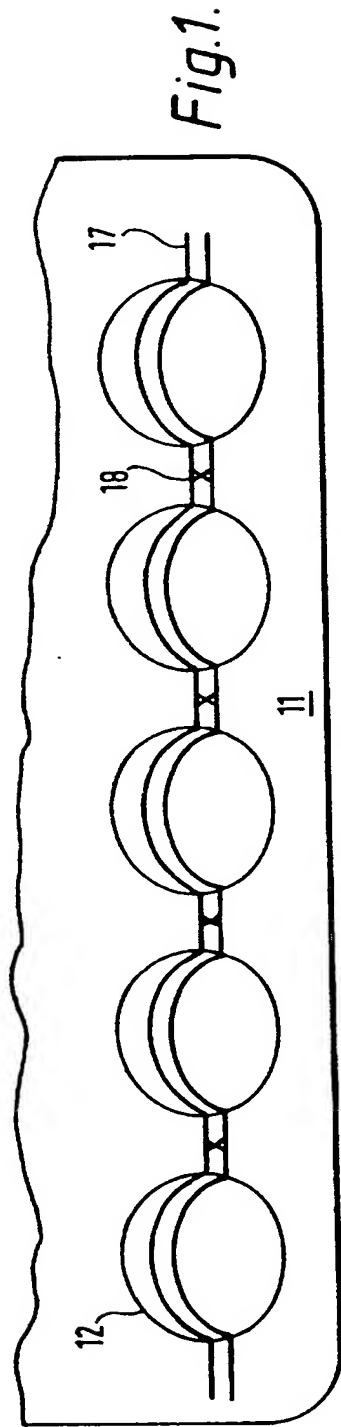
9. A blister pack according to claim 7 wherein the

thread portions are joined between each blister by a slip knot, the ends of the thread portions being secured in a manner which permits one preselected blister to be first opened, and the slip knots permitting slackening of the thread portions in said predetermined sequence.

10. A blister pack according to claim 7 wherein said directional release means comprises a peelable seal releasable by peeling in predetermined direction.

11. A blister pack according to any preceding claim and further including printed indicia to indicate the first blister of said predetermined sequence.

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# INTERNATIONAL SEARCH REPORT

International Application No  
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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 B65D75/34

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 B65D

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 227 190 A (ALUSUISSE) 22 November 1974 see page 4, line 17 - line 26; claims 1-3; figure 2 ---	1,2,10
A	WO 96 03329 A (UPJOHN CO ;LEBLONG WAYNE T (US)) 8 February 1996 see claims 1,13,14; figures ---	1,2,10
A	US 4 232 787 A (HOLIDAY ANNE) 11 November 1980 see column 2, line 35 - line 45; figures ---	
A	US 2 546 698 A (NICOLLE) 27 March 1951 see claims; figures ---	
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 469 968 A (MATTHEWS GENE C ET AL) 28 November 1995 see abstract; figures ---	
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